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FEBRUARY 1985 NUMBER 198

MONTHLY REPORT

ON THE NUCLEAR FUEL MARKET

NUEXCO

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MONTHLY REPORT ON THE NUCLEAR FUEL MARKET

February 1985 No. 198

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To Our Readers

Nuexco announces the election of George White, Jr. as Chairman of the Board of Directors replacing Bob Wolcott, who resigned.

From its founding in 1968, Nuexco has benefited from sound leadership. Founders George White, Sr. and A. Payne Kibbe were innovators and builders, taking an idea and turning it into reality. During the past eight years, Bob Wolcott's vision developed Nuexco into an international, full-service nuclear fuel organization. Bob's contribution was enormous and enduring.

The new management looks forward to continuing this record of excellence.

* * *

Nuexco will host a hospitality suite during the Atomic Industrial Forum's Fuel Cycle Conference in New Orleans, Louisiana, March 12–15, at the Hyatt Regency. We look forward to seeing you there.

* * *

Nuexco's US offices will be closed on Monday, February 18 in honor of George Washington and Abraham Lincoln's birthdays. Our European office will be open for business as usual.

* * *

Included in this Report is a map to our offices in Stamford, Connecticut. We welcome customer visits.

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NATURAL URANIUM AND SECONDARY MARKET CONVERSION

The **Exchange Value** as of January 31, 1985 is **$15.00** per pound U_3O_8, down $0.25 since last month. **Active supply** of natural uranium (U_3O_8 and UF_6) for spot or near-term delivery totals **4,180,000** pounds U_3O_8 or equivalent UF_6, up 540,000 pounds since last month. The corresponding figure for **active demand** is **1,265,000** pounds, up 15,000 pounds. The spot and near-term **supply-demand ratio** rose to **3.3:1.**

The *Current Market Data* section of this Report lists two uranium sales transactions, involving a total of approximately 500,000 pounds equivalent U_3O_8. One of the transactions reported this month involved low-enriched uranium, both involved deliveries before 1986, and one met the criteria for inclusion in the current Transaction Value calculation.

The **Transaction Value** as of January 31, 1985 is **$16.20** per pound U_3O_8, up $0.30 since last month. The current Transaction Value includes 14 transactions involving a total of 2.1 million pounds U_3O_8 or equivalent UF_6 and covers a period of 7 months. The Transaction Value rose as a result of dropping from the calculation June data, which included a transaction for a large quantity at a low price.

The **Loan Use Charge Rate** as of January 31, 1985 is **6 percent** per annum, unchanged since last month in a dormant market.

* * *

The Exchange Value declined for the fourth month in a row as the market for natural uranium concentrates continued to weaken. At $15.00, it has reached its lowest level since December 31, 1974. Buyers continue to hold out for the best possible terms, keeping market activity at a minimum and applying significant downward pressure on the Exchange Value. The buyer and seller indifference level, or that price range in which transactions may be completed between buyers that are willing but not pressured to buy and sellers that are willing but not forced to sell, has widened over the past several months. However, Nuexco has seen some indications of late that the gap might be narrowing; some buyers seem to be preparing to act as though they believe the market is approaching a low price plateau.

Several offers hovered below the $15.00 level, but certain contingencies applied which rendered them unfeasible. One seller chose not to sell immediately, and other opportunities involved quantities too small to be deemed significant. The typical quantity desired by buyers is something approximately equal to one reload. Quantities less than that need to be discounted substantially to overcome the buyers' reluctance to piece together several small lots to acquire the desired quantity. Substantial quantities of material remain available, both as UF_6 and as concentrates, so downward pressure on market prices continues.

* * *

The **Conversion Value** is **$1.00** per pound U in UF_6, up $0.20 since last month. One secondary market conversion transaction is reported, involving approximately 500,000 pounds U in UF_6. Active supply of secondary market conversion services for delivery within three years disappeared as the lone supplier withdrew from the market. Furthermore, one potential buyer for a large quantity has given indications of willingness to pay approximately $1.00 per pound U as UF_6 for conversion services on the secondary market. Active secondary market demand for conversion amounts to 760,000 pounds U in UF_6.

ENRICHED URANIUM AND SWUS

The Nuexco **SWU Values** as of January 31, 1985 are:

1. For **DOE origin,** a tails assay of 0.30 weight-percent U_{235}, and certifiable as excess:
   a. For FY85 delivery, $112 per SWU, unchanged;
   b. For FY86 delivery, $15 discount from the USEC base price on delivery, unchanged;
2. For **other** SWUs (includes DOE origin SWUs not certifiable as excess and non-DOE origin SWUs):
   a. For delivery in calendar year 1985, $80 per SWU, unchanged;
   b. For delivery in calendar year 1986, $90 per SWU, unchanged.

Two secondary market SWU transactions are reported, involving approximately 100,000 SWUs. One of the transactions involved low-enriched uranium.

* * *

SWU Values were unchanged this month as the lack of activity precluded a noticeable change in market prices. The market for DOE SWUs and FY85 delivery should remain open but inactive through February, until DOE announces new FY86 prices. Activity in the FY85 market has been very slow, and only a few sellers are still active. One new buyer, possibly the last FY85 SWU buyer, entered the market in January. The number of buyers interested in DOE SWUs for FY86 delivery is increasing, and they are preparing to enter the market following the DOE announcement. The timing for secondary market purchases is awkward now, because the absence of firm DOE prices for FY86 SWU makes economic comparisons difficult.

The market for SWUs other than DOE certifiable is almost dormant. Most utilities have filled all requirements until 1987, at which point the USEC allows many to fulfill 30 percent of requirements. Consequently, demand in Europe and the USA is very low. European buyers, however, are beginning to show more interest in long-term SWU purchases, most for 1987 and beyond.

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CURRENT MARKET DATA

January 31, 1985	Market Values	Active Supply[1] (thousands)	Active Demand[1] (thousands)
EXCHANGE VALUE	**$15.00**/lb. U_3O_8	4,180	1,265
CONVERSION VALUE	**$1.00**/lb. U in UF_6	0	760
SWU VALUES			
DOE origin, certifiable as excess, 0.3 tails assay			
FY85 delivery	**$112**/SWU		
FY86 delivery	**$15** discount/SWU		
Other SWUs (non-DOE or non-certifiable)			
calendar year 1985 delivery	**$80**/SWU		
calendar year 1986 delivery	**$90**/SWU		
LOAN USE CHARGE RATE	6%/annum	0	0

TRANSACTION VALUE	$/lb. U_3O_8	Millions of Pounds	Number of Transactions	Number of Months
	[illegible].20	2.1	14	7

[1]Supply and demand tables in the *Current Market Data* section of this Report detail the numbers for each category.

DEFINITIONS

1. The **Exchange Value** is Nuexco's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the date indicated.
2. The **Conversion Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of conversion services could be concluded in the secondary market as of the date indicated.
3. The **SWU Values** represent Nuexco's judgment of the price at which transactions for the sale of significant quantities of SWUs of stated origin for delivery in the specified time period could be concluded as of the date indicated.
4. The **Loan Use Charge Rate** is Nuexco's judgment of the annual interest rate at which uranium loans could be concluded as of the date indicated.
5. The **Transaction Value** is a weighted average price of recent natural uranium sales transactions. The calculation is based on prices paid in:
   a. Transactions closed within the previous three-month period for which delivery is scheduled within one year of the transaction date;
   b. At least ten transactions;
   c. Transactions involving a sum total of at least 2 million pounds U_3O_8 equivalent.

   The sample time is extended as necessary to include these minima. Other currencies are converted to US dollars using conversion rates in effect on or near the transaction date.

DERIVATIONS AND COMMENTS

1. All Market Values are based on:
   a. Data from recently completed transactions.
   b. Data from pending transactions.
   c. Firm bids to buy or borrow, and firm offers to sell or lend.
   d. Prices purchasers or rates borrowers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy or borrow, and prices sellers or rates lenders have expressed a willingness to offer, but for which Nuexco is not aware of firm offers to sell or lend.
2. Prices associated with deliveries under old or renegotiated contracts or other than arm's-length transactions are not considered in the determination of these Market Values.
3. In the determination of the Conversion Value, Nuexco does not consider transportation charges other than those customarily provided by primary suppliers of conversion services.
4. The prices of conversion services or SWUs delivered under long-term contracts with primary suppliers are not considered in the determination of either the Conversion Value or SWU Value.
5. For the DOE SWU Values, Nuexco converts SWU prices at varying tails and product assays to equivalent SWU prices at a tails assay of 0.30 weight-percent U_{235} and a product assay of 3.0 weight-percent U_{235}, assuming feed costs corresponding to the Nuexco Exchange and Conversion Values determined as of the same date.
6. In calculating the Transaction Value, Nuexco does not account for the price of uranium delivered in connection with contracts which call for "market price" mechanisms. This exclusion applies particularly to contracts in which delivery prices are expressed as a function of future Exchange Values or any other indeterminant variable. Also excluded from the calculation are any other transactions in which the delivery price is defined in such a way that it cannot currently be determined.

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CURRENT MARKET DATA

EXCHANGE VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U_3O_8 in Concentrates			per kg. U in Concentrates		
	This Month (Jan. 31, 1985)	Last Month (Dec. 31, 1984)	12 Months Ago (Jan. 31, 1984)	This Month (Jan. 31, 1985)	Last Month (Dec. 31, 1984)	12 Months Ago (Jan. 31, 1984)
Australia (dollar)	18.38	18.37	22.33	47.78	47.77	58.06
Belgium (comm. franc)	949.37	960.33	1,177	2,468	2,497	3,061
Canada (dollar)	19.91	20.13	25.60	51.77	52.34	66.54
Finland (markka)	99.40	99.48	121.81	258.43	258.62	316.67
France (franc)	145.07	147.20	176.42	377.14	382.69	458.65
FRG (mark)	47.53	47.99	57.65	123.56	124.75	149.87
Italy (lira)	29,240	29,480	35,121	76,017	76,641	91,306
Japan (yen)	3,817	3,814	4,809	9,923	9,917	12,502
Netherlands (guilder)	53.74	54.08	64.83	139.72	140.59	168.55
South Africa (rand)	29.56	29.99	25.98	76.84	77.97	67.55
Spain (peseta)	2,628	2,638	3,250	6,832	6,857	8,450
Sweden (krona)	135.62	136.53	167.76	352.59	354.94	436.13
Switzerland (franc)	40.11	39.54	45.97	104.27	102.79	119.52
UK (pound)	13.27	13.10	14.56	34.50	34.05	37.87
US (dollar)	15.00	15.25	20.50	39.00	39.65	53.30

TRANSACTION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U_3O_8 in Concentrates			per kg. U in Concentrates		
	This Month (Jan. 31, 1985)	Last Month (Dec. 31, 1984)	12 Months Ago (Jan. 31, 1984)	This Month (Jan. 31, 1985)	Last Month (Dec. 31, 1984)	12 Months Ago (Jan. 31, 1984)
Australia (dollar)	19.85	19.16	25.11	51.60	49.80	65.28
Belgium (comm. franc)	1,025	1,001	1,324	2,666	2,603	3,442
Canada (dollar)	21.51	20.99	28.78	55.91	54.57	74.82
Finland (markka)	107.36	103.72	136.96	279.10	269.64	356.06
France (franc)	156.67	153.47	198.36	407.31	399.00	515.70
FRG (mark)	51.33	50.03	64.82	133.45	130.07	168.52
Italy (lira)	31,579	30,737	39,489	82,098	79,908	102,664
Japan (yen)	4,122	3,977	5,407	10,717	10,339	14,057
Netherlands (guilder)	58.04	56.38	72.90	150.90	146.58	189.52
South Africa (rand)	31.92	31.27	29.21	82.99	81.29	75.95
Spain (peseta)	2,838	2,750	3,655	7,378	7,149	9,501
Sweden (krona)	146.47	142.35	188.63	380.80	370.07	490.38
Switzerland (franc)	43.32	41.22	51.69	112.61	107.17	134.39
UK (pound)	14.33	13.65	16.38	37.25	35.50	42.58
US (dollar)	16.20	15.90	23.05	42.12	41.34	59.92

[1] Calculated using currency exchange rates published in the *Wall Street Journal* on January 31, 1985.

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CURRENT MARKET DATA

CONVERSION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U as UF_6			per kg. U as UF_6		
	This Month (Jan. 31, 1985)	Last Month (Dec. 31, 1984)	12 Months Ago (Jan. 31, 1984)	This Month (Jan. 31, 1985)	Last Month (Dec. 31, 1984)	12 Months Ago (Jan. 31, 1984)
Australia (dollar)	1.23	0.96	0.65	2.70	2.13	1.44
Belgium (comm. franc)	63.29	50.38	34.46	139.53	111.06	75.98
Canada (dollar)	1.33	1.06	0.75	2.93	2.33	1.65
Finland (markka)	6.63	5.22	3.57	14.61	11.50	7.86
France (franc)	9.67	7.72	5.16	21.32	17.02	11.38
FRG (mark)	3.17	2.52	1.69	6.99	5.55	3.72
Italy (lira)	1,949	1,546	1,028	4,298	3,409	2,266
Japan (yen)	254.45	200.10	140.75	560.97	441.14	310.29
Netherlands (guilder)	3.58	2.84	1.90	7.90	6.25	4.18
South Africa (rand)	1.97	1.57	0.76	4.34	3.47	1.68
Spain (peseta)	175.19	138.36	95.13	386.23	305.03	209.73
Sweden (krona)	9.04	7.16	4.91	19.93	15.79	10.82
Switzerland (franc)	2.67	2.07	1.35	5.89	4.57	2.97
UK (pound)	0.88	0.69	0.43	1.95	1.51	0.94
US (dollar)	1.00	0.80	0.60	2.20	1.76	1.32

SWU VALUES EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	DOE SWU FY85 (January 31, 1985)	Non-DOE SWU 1985 delivery (January 31, 1985)	Non-DOE SWU 1986 delivery (January 31, 1985)
Australia (dollar)	137.22	98.02	110.27
Belgium (comm. franc)	7,089	5,063	5,696
Canada (dollar)	148.68	106.20	119.47
Finland (markka)	742.21	530.15	596.42
France (franc)	1,083	773.69	870.41
FRG (mark)	354.88	253.49	285.17
Italy (lira)	218,324	155,945	175,439
Japan (yen)	28,499	20,356	22,901
Netherlands (guilder)	401.29	286.64	322.47
South Africa (rand)	220.69	157.64	177.34
Spain (peseta)	19,622	14,015	15,767
Sweden (krona)	1,013	723.33	813.74
Switzerland (franc)	299.47	213.90	240.64
UK (pound)	99.07	70.77	79.61
US (dollar)	112.00	80.00	90.00

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on January 31, 1985.

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RECENT TRANSACTIONS[1]

Uranium Sales

Nuexco Transaction Number	Delivery Period	Approximate Quantity (thousands of pounds, U_3O_8 equivalent)	Approximate Price as Percent of Current E.V.	Seller	Buyer	Remarks
3291A	1985	301-600	R[2]; see remarks	European Utility	US Fabricator	LEU (assumes 0.3% tails assay). Not an arm's length transaction.
3269	1985	101-300	103	US Producer	US Utility	

[1]Transactions listed are not limited to those in which Nuexco was involved, but also include others of which Nuexco is aware.
[2]The notation *R* means that Nuexco either does not know, or that Nuexco has restricted that information to protect client confidentiality.

Secondary Market Conversion Services

Nuexco Transaction Number	Delivery Period	Approximate Quantity (thousands of pounds, U equivalent)	Approximate Price as Percent of Current C.V.	Seller	Buyer	Remarks
3288	1985	300-601	100	US Utility	European Utility	

Enrichment Services
Secondary Market Sales

Nuexco Transaction Number	Delivery Period	Approximate Quantity[2] (thousands of SWUs)	Approximate Price[3] as Percent of Current SWU Value[4]	Seller Group	Buyer Group	SWU Origin	Remarks
3291B	1985	50-100	R[5]	European Utility	US Fabricator	R[5]	LEU (assumes 0.3% tails assay). Not an arm's length transaction.
3264	1985	less than 50	91	R[5]	European Utility	DOE	Occurred in late 1984.

[1]Transactions listed are not limited to those in which Nuexco was involved, but also include others of which Nuexco is aware.
[2]If tails assay is unknown or unspecified, Nuexco's calculation of SWU quantity assumes 0.30 w/o tails assay.
[3]Price is not normalized to 0.30% tails assay.
[4]Refers to SWU Value that corresponds to SWUs included in transaction. When prices and SWU values are expressed as discounts (e.g., X dollars less than DOE's USEC base price at time of delivery), the percentage refers to the ratio of the *discounts*, not the ratio of the prices.
[5]The notation *R* means that Nuexco either does not know, or that Nuexco has restricted that information to protect client confidentiality.

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CURRENT MARKET DATA

URANIUM SUPPLY
(January 31, 1985)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale:			
ACTIVE			
1575	500	500 per year	
1860	400	1,500 per year	
2038	1,000	1,000 per year	UF_6
2134*	220	220 per year	1986-87
2236*	200	200 per year	1986-89
2288A	40	—	
2288B	295	—	UF_6
2389*	200	—	
2392	35	—	UF_6
2499	15	—	
2516	200	—	
2538*	35	—	
2538A*	130	—	UF_6
2565	400	—	
2569	200	—	
2584*	300	—	
2603*	10	—	
2263	—	500 per year	1985-90
2625	—	300 per year	1988-97
2657*	—	980	1986; UF_6
TOTAL:	4,180		
INACTIVE			
2191	125	—	UF_6
2275	150	—	
2335	275	—	
2336	250	250 per year	1985-94
2495	130	—	UF_6
2509	1,200	1,600	UF_6
2553	300	—	
2664*	250	250 per year	UF_6
0564	—	1,000 per year	1985-90
2271	—	500 per year	1985-88
2297	—	200 per year	1986-89
2326	—	1,000 per year	1989-91
2368	—	250 per year	1987-90
2514	—	1,000 per year	
2574	—	500	UF_6
TOTAL:	2,680		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 2473.

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CURRENT MARKET DATA

URANIUM DEMAND
(January 31, 1985)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Inquiries to Purchase:			
ACTIVE			
2457A*	130	—	
2548	300	—	
2590	475	—	U_3O_8 or UF_6
2636*	200	—	
2690*	160	—	
2217	—	1,000 per year	1989-95
2442	—	4,000	1986-95
2507	—	600	1987-89
2540	—	400 per year	1989-94
TOTAL:	1,265		
INACTIVE			
2329	500	—	1985
2576	20	—	UF_6
2638*	350		UF_6
1999	—	50 per year	1986-90
2244	—	350 per year	1987 on
2414*	—	365	1987-88
2457B*	—	650	1987
2586	—	300	1987
2643	—	150 per year	1987 on
2674*	—	1,000	
TOTAL:	870		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 2533, 2419B.

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CURRENT MARKET DATA

CONVERSION SUPPLY AND DEMAND
(January 31, 1985)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U as UF_6) Within 3 Years	Beyond 3 Years	Remarks
Available for Sale:			
ACTIVE			
TOTAL:	0		
INACTIVE			
2051	1,000	—	
2438	500	250 per year	1986-87
2511	600	700	1986-90
TOTAL:	2,100		
Inquiries to Purchase:			
ACTIVE			
2602*	460	—	
2638A*	300	—	
TOTAL:	760		
INACTIVE			
2644*	—	475	1987 on
2587*	285	—	
TOTAL:	285		

*New or revised since last month.
[1]Measured from the date of this Report.
Projects removed since last month: 2141.

LOAN SUPPLY AND DEMAND
(January 31, 1985)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Within 1 Year	Beyond 1 Year	Remarks
Available for Loan:			
INACTIVE			
1938	2,000	—	UF_6
2128	700	—	
2139	2,000	—	
2469A	800	—	
2483	550	—	
TOTAL:	6,050		

*New or revised since last month.
[1]Measured from the date of this Report.
No inquiries to borrow this month.

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SWU SUPPLY
(January 31, 1985)

Nuexco Project Number	Delivery Period[1] (Thousands of SWUs) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale:			
ACTIVE			
2100	150	100 per year	
2359*	—	200	
2583	50	—	
2624	100	—	
2631	150	—	
2632	25	—	
2689*	40	—	
2285	—	300	
2513	—	25	1986
2517	—	150	1986-89
2571*	—	55	1987
2657A*	—	175	1986
TOTAL:	515		
INACTIVE			
2164	25	—	
2589	50	—	
2378*	—	120	1988
2510*	—	50	
2531	—	150	1987
TOTAL:	75		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes SWUs deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: None.

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CURRENT MARKET DATA

SWU DEMAND
(January 31, 1985)

Nuexco Project Number	Delivery Period[1] (Thousands of SWUs) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Inquiries to Purchase:			
ACTIVE			
2459	30	—	
2480	30	—	
2655	10	—	
2665*	50	—	
2519	—	30 per year	1987 on
2578	—	100	1986
2640*	—	40	1987
2653	—	100	1986-90
2658	—	5	1986
2689A*	—	40	1986
TOTAL:	120		
INACTIVE			
2543	25	25	1986
2585*	90	90	1986
2500	—	500	1987-90
2512	—	15 per year	1987 on
2595	—	50	1986
TOTAL:	115		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes SWUs deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 2443.

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PRIMARY MARKET CONVERTERS IN THE USA

The current uranium enrichment technology requires a gas as feed material, and commercial milling technologies produce natural uranium in solid form. Therefore, the enrichment process requires the conversion of solid uranium concentrates to a gas, uranium hexafluoride (UF_6). The conversion process is performed by five primary converters in the Western world. Because it represents only about three percent of fuel cycle costs (and less than one percent of electricity costs), the conversion process often is overlooked. UF_6 stockpiles at conversion plants and declining sales have caused converters to operate at substantially less than nameplate capacities. In today's buyers' market, the oversupply has not yet been counteracted by strong demand; in fact, the oversupply continues to grow. Although converters' inventories further complicate the true conversion supply situation, it is clear that there is already in place more conversion capacity than necessary for at least fifteen years. Nuexco forecasts indicate worldwide UF_6 consumption will be approximately 30,000 metric tons of uranium (MTU) in UF_6 in 1985, 40,000 MTU in 1990, and 45,000 MTU in 1995 (Table 1). On the other hand, current Western world conversion capacity already exceeds 50,000 MTU per year (Table 2).

Two companies in the USA provide conversion services for the world market. Allied Chemical, a division of Allied Corporation, converts uranium concentrates to UF_6 at its facility in Metropolis, Illinois. Sequoyah Fuels Corporation, a subsidiary of Kerr-McGee Corporation, converts natural uranium at its plant in Gore, Oklahoma.

Table 1

WORLD CONVERSION REQUIREMENTS FORECAST[1]
(Thousands MTU in UF_6)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
United States	9.9	12.6	11.7	12.4	12.5	12.5	12.9	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6
Europe[2]	13.1	16.6	16.7	17.3	17.6	18.0	18.3	18.4	19.5	20.2	19.4	20.6	20.2	20.9	20.2
Far East[3]	4.3	6.1	6.2	6.4	7.1	7.5	7.3	8.6	8.9	8.6	9.5	9.8	10.3	10.7	10.0
Other Nations[4]	1.7	1.8	2.0	2.1	2.6	2.4	2.5	2.3	3.0	2.6	3.1	2.6	2.8	2.8	2.8
TOTAL[5,6]	29.0	37.1	36.6	38.2	39.7	40.4	41.1	41.9	43.9	43.9	44.5	45.5	45.8	47.0	45.6

[1] Table ignores lead time for conversion. Consumption is based on computed quantities of U_3O_8 used to fabricate fuel for loading and reloading reactors operating, under construction, on order or forecasted as of November 15, 1984. Compiled and computed on a reactor-by-reactor bases, quantities for each reactor are based on specific core characteristics, 0.25% tails assay, no recycling, 24-month lead time for procuring first cores and 12-month lead time for procuring each reload. The estimates reflect annual consumption and not refueling quantities. First core fuel previously procured is not included.
[2] Austria, Belgium, Finland (two Swedish-supplied plants), France, Germany (FRG), Italy, Netherlands, Portugal, Spain, Sweden, Switzerland, United Kingdom, and Yugoslavia.
[3] China (PRC), Japan, Korea, Philippines, Taiwan.
[4] Argentina, Brazil, Canada, Egypt, India, Mexico, Pakistan, South Africa.
[5] Excludes Bulgaria, Cuba, Czechoslovakia, Germany (GDR), Finland (two USSR-supplied plants), Hungary, Poland, Rumania, and the USSR.
[6] Columns may not add, due to rounding.

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BASIC CONSIDERATIONS

The two companies provide conversion for most of the reactors in the USA, and for about forty percent of the reactors worldwide (Table 2).

Table 2

MARKET SHARES OF PRIMARY CONVERTERS[1]

Converter	Plant Location	Capacity (MTU/year)	Market Share (%) USA	World
Allied Chemical	Metropolis, Illinois	12,700	45	20
Sequoyah Fuels	Gore, Oklahoma	9,000	40	21
Other Converters[2]	—	33,000	8	46
Uncovered or Unknown	—	—	7	13

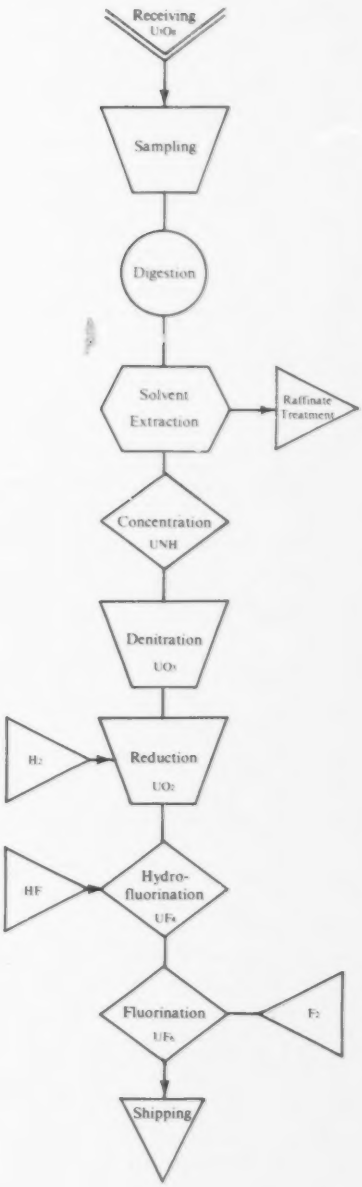
[1]Based on the number of operational reactors (commercial or not) supplied by each converter.
[2]BNFL (British Nuclear Fuels, Ltd.), Comurhex, Eldorado.

Allied began converting uranium concentrates at its plant in Metropolis, Illinois, in 1959. Using the dry fluoride volatility process, Allied currently has an annual capacity of 12,700 MTU, and has shipped over 150 million pounds of UF_6. The dry process is used to convert solid natural uranium concentrates only, the most common form. Sequoyah Fuels began operation in 1970 with an annual conversion capacity of 4,550 MTU. In 1978, Sequoyah expanded the facility, increasing its annual capacity to 9,000 MTU and introduced technology capable of processing slurry forms of uranium concentrates, which are becoming more prevalent due to the increasing use of alternative recovery methods. The conversion of slurry through the wet process eliminates the need for drying and packaging slurry at the milling site.

Sampling

Solid natural uranium concentrates (U_3O_8) are shipped by truck from a mill. Upon receipt, each 55-gallon drum is weighed, and the powder is dumped into an elevated hopper for sampling. Both Allied and Sequoyah Fuels retain an independent weighing and sampling firm, Lucius Pitkin, Inc. The concentrates are sampled for moisture content, uranium content and impurities, as well as overall weight.

Figure 1. Wet Conversion Process



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Pitkin utilizes the falling-stream method of sampling, in which several sample cutters remove ten percent of the material dumped in a falling stream from the feed batch. The process is repeated several times to insure a representative sample. Both the shipper and the receiver (converter) accept Pitkin's results on moisture content and weight. To verify uranium content and impurities, samples are sent to both producer and converter. If the parties agree to within 0.20 percent (Allied requires agreement to within 0.21 percent), the results are deemed acceptable. If they do not agree, the sample can be umpired, in which case the losing party pays for the independent umpiring.

At Sequoyah Fuels, uranium concentrates received in slurry form from solution mining usually arrive via tank trailer with approximately 4,000-gallon capacity. Nitric acid is added to the tank to dissolve the slurry, and the solution is pumped to a weigh tank for measurement and sampling.

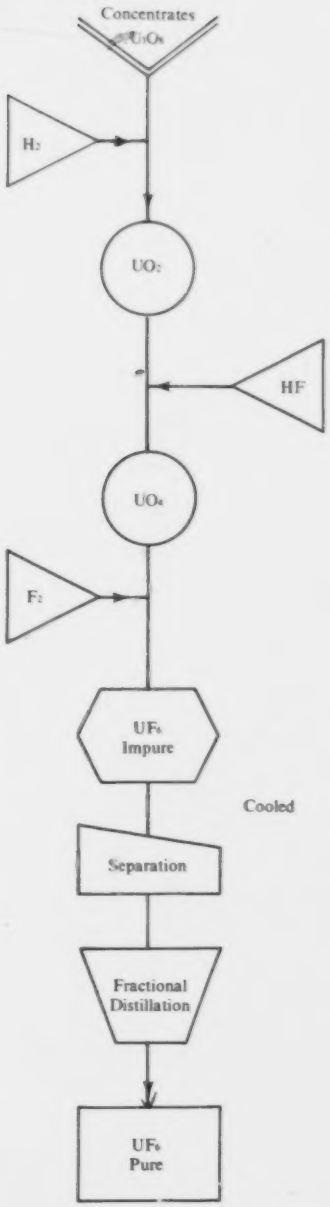
Conversion

In Sequoyah's wet process, conversion begins with the dissolution of uranium concentrates into uranyl nitrate using nitric acid (Figure 1). After the nitric acid digests the concentrates the solution is similar to the slurry-nitric acid mixture found in the tank trailers (to which it often is added). Various solvent extraction methods follow, in which the uranyl nitrate is scrubbed of impurities. The uranium is separated from the acid solution by mixing with organic solvents and settling, leaving the impurities in the acid solution. This barren acid solution, or raffinate, is removed and the purified uranyl nitrate is re-extracted into water. A concentration step follows, in which evaporation concentrates the weak uranyl nitrate solution into molten uranyl nitrate hexahydrate (UNH), an intermediate which subsequently undergoes denitration (the removal of the nitrate through thermal decomposition) to form uranium trioxide (UO_3).

The next steps involve the reduction and fluorination of the UO_3 powder. Hydrogen is introduced, capturing oxygen to form UO_2 and water (H_2O). The UO_2 powder then reacts with hydrofluoric acid (HF) to become UF_4, known as green salt. Finally, the UF_4 reacts with elemental fluorine to form UF_6. Allied and Sequoyah Fuels manufacture their own fluorine; Sequoyah produces fluorine gas by electrolysis at the conversion site, while Allied operates a commercial hydrofluoric acid (HF) plant in Geismar, Louisiana.

Sequoyah Fuels processes slurry by adding nitric acid to the slurry in the tank trailer for digestion, and pumping

Figure 2. Dry Conversion Process



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the solution into weigh tanks for measurement. Liquid samples are taken, and the solution joins the separation system.

Allied's dry process differs from wet processing in several ways. The first step consists of the direct fluorination of the U_3O_8 concentrates (Figure 2). Hydrofluoric acid reacts with the uranium oxides or ammonium diuranate (ADU), and the impure UF_6 undergoes a series of purification steps. Problems in the dry process can arise when magnesium or sodium uranates are used; the HF reaction forms sticky products which can adhere to the reactor walls at the conversion facility. No significant differences in quality of UF_6 have been found between the two conversion processes, although the wet process contains the flexibility to convert slurries and other non-solid forms of feed material.

Following conversion, the UF_6 gas enters cold traps designed to liquify the gas so it can be drained into shipping cylinders. As the cylinders cool to room temperature, the UF_6 solidifies. Because of the tremendous weight of the solid UF_6, a truck can transport only two ten-ton (6,400 Kg) cylinders at a time. Fourteen-ton (8,400 Kg) cylinders often are used when shipping overseas. The cylinders are then ready for shipment to one of DOE's enrichment plants, or, in some cases, to an overseas enrichment plant.

Conversion Supply and Demand

It is difficult to determine true world supply figures for conversion. Most of the facilities in operation today currently operate well below full nameplate capacity because of the industry's oversupply situation. The flow of uranium concentrates into conversion facilities remains greater than the flow of UF_6 to enrichment plants, resulting in the buildup of large stockpiles at the conversion sites. Moreover, the rate at which the converter processes material is subject to a number of variables, including the efficiency of the electrolytic elemental fluorine plant.

Similarly, conversion demand can be influenced by many variables. A higher enrichment tails assay would result in increased uranium demand, proportionately increasing the need for UF_6. Reprocessing, with respect to both uranium recycling and plutonium, would reduce significantly the demand for natural uranium, but commercial applications are a long-term consideration and should not affect conversion demand in this century. These uncertainties pose only minor problems for converters when planning for expansion or a new facility, the construction of which requires a lead time of approximately five years.

In March 1985, DOE will announce its intentions for the future of uranium enrichment in the USA. One of the new technologies under consideration, Atomic Vapor Laser Isotope Separation (AVLIS), is a method of drawing off the U_{235} isotope by laser excitement. This process uses uranium metal as feed material for enrichment, instead of UF_6. Should DOE decide to proceed with AVLIS as its enrichment technology of the future, the conversion industry in the USA would be forced to adapt accordingly.

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RECENT DEVELOPMENTS

AUSTRALIA

In view of the current state of the uranium market, the announcement by Energy Resources of Australia, Ltd. (ERA) of two long-term supply contracts with US utilities was both surprising and revealing. The agreement with American Electric Power (AEP) is actually a renegotiation of the original AEP-Ranger agreement under which deliveries had been suspended because market prices had fallen well below the Australian floor price. The second agreement is with Pennsylvania Power & Light.

Notwithstanding the press response to the ERA announcement, it is most unlikely that US utilities would agree to terms that could require them to buy large amounts of uranium at prices substantially higher than spot market prices. Accordingly, it is probable that these agreements are, in effect, *call* options that allow considerable delivery flexibility and provide that if, as, and when market prices exceed the Australian floor price, the utilities may call on ERA for delivery at discounts from market price. Alternately, the contracts could be structured as *put* options, giving ERA the right to deliver to the utilities at prices below market whenever certain contract terms are met, such as market price exceeding the Australian floor price for a specified period. In either case, the contracts probably do not require the utilities to take and pay for any meaningful quantities while market price is below the Australian floor.

Perhaps the greatest significance of these contracts is the continuing, subtle maneuvering for position between ERA and the Olympic Dam project (Roxby Downs). As ERA adds customers, Olympic Dam's roster of potential customers is reduced accordingly. If the present floor price is maintained (or raised), neither ERA nor Olympic Dam would be able to export under market price contracts until market prices rise sharply or the floor price is reduced. In either case, ERA's ability to increase capacity rapidly and at lower cost per unit seems to give it a considerable advantage over Olympic Dam, which has to base load, finance, and construct an entirely new facility.

However, the Olympic Dam partners, Western Mining and British Petroleum, have their own unique situation. Preliminary marketing is under way, and with copper and gold as co-products, usual financing requirements may be alleviated. This would allow uranium production to begin at levels that might be sub-economic in a stand-alone uranium operation. Finally, the Olympic Dam project presents the prospect of supply diversity within Australia combined with very large, long-term reserves backed by financially responsible ownership.

* * *

Western Mining Corporation (WMC) and BP Australia, the joint venture partners in the Olympic Dam project (Roxby Downs), have commissioned Fluor Corporation to carry out a technical study. The study will be completed in March 1985 and is part of the A$150 million feasibility study now in progress. Because market demands for the planned copper and uranium production are limited, the project will be designed to reach full production in stages. The first stage will be designed to treat high-grade ore averaging three percent copper, 3.3 pounds U_3O_8 and 0.4 grams of gold per ton of ore. Annual yield would be 2,000 metric tons of U_3O_8 and 55,000 metric tons of copper starting in 1988. Gold production could begin earlier at a rate of 100,000 ounces per year. Part of the study will review the work done to date, but it also signals the further acceleration of the project by WMC and BP toward their goal of beginning production in the late 1980s.

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RECENT DEVELOPMENTS

SOUTH AFRICA

Fourth quarter production from Chamber of Mines producers amounted to approximately 3.4 million pounds U_3O_8, down slightly (4 percent) from the 3.5 million pounds produced in the third quarter, and the average of 3.7 million pounds produced in the first three quarters of 1984. Most of this decline can be attributed to the following factors:

1. An 85-percent drop in production at Beisa (St. Helena) following the cessation of mining operations and the completion of underground reclamation;
2. A 40-percent decline in production at Blyvooruitzicht due to the slowing of operations following a decision to cease production by 1985;
3. A 31-percent decline at Driefontein Consolidated because of lower grades and a reduction of throughput in the closing months of 1984.

These losses were partially offset by a 37-percent production increase at JMS (Free State Joint Metallurgical Scheme), and a 10-percent increase at Buffelsfontein.

* * *

Total production in 1984 of 14,531,000 pounds U_3O_8 was five percent less than 1983 (Table 3). Eight producers experienced declines in production totalling approximately 1.2 million pounds, over 60 percent of which was attributed to Harmony, Beisa, and JMS (notwithstanding its fourth-quarter production increase). This decline was partially offset by increases in production by three producers amounting to approximately 450 thousand pounds. Randfontein and Vaal Reefs contributed 90 percent of the increase.

South Africa's gold and uranium industries experienced a relatively prosperous year despite lower US dollar prices for gold (Table 4). South Africa's contracts customarily are denominated in US dollars. Although most South African uranium sales involve long-term contracts in which spot prices do not play a crucial role, examining the relationship between the Exchange Value expressed in dollars and that expressed in rands can give an indication of the currency exchange rate's effect on long-term uranium prices. The Exchange Value declined 31 percent in dollar terms during 1984, but the 61-percent increase in the currency exchange rate caused the Exchange Value to rise 12 percent in rand terms. Moreover, because the prices South African producers received under long-term contracts did not decline in dollar terms nearly as much as did the Exchange Value, South Africa's long-term prices increased in rand terms even more than the 12 percent by which the Exchange Value increased. The severe depreciation of the rand in relation to the dollar also resulted in record rand gold prices. Since by-product and co-product uranium production from gold mining in general costs less than primary uranium production, the gold/uranium operations strongly contributed to the viability of the uranium industry in South Africa.

Palabora Mining Company (PMC) announced in its annual report to shareholders that it sold 502 thousand pounds of uranium concentrates in 1984. This represents a 29-percent increase from the 356 thousand pounds sold in 1983. PMC, which is not a member of the Chamber of Mines, produces uranium as a by-product of its copper-mining operations.

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Table 3

REPUBLIC OF SOUTH AFRICA: 1984 URANIUM PRODUCTION[1]
(Thousands of pounds U_3O_8)

Operation	First Quarter 1984	Second Quarter 1984	Third Quarter 1984	Fourth Quarter 1984	Total 1984 Production
Beisa (St. Helena)[2]	338	333	107	16	794
Blyvooruitzicht	155	132	142	85	514
Buffelsfontein	313	331	337	371	1,352
Chemwes (Stilfontein)	310	279	290	276	1,155
Driefontein Consolidated	98	104	88	61	351
ERGO[3]	113	94	71	84	362
Harmony	307	259	274	255	1,095
Hartebeestfontein	248	253	225	237	963
JMS[4]	356	265	293	402	1,316
Randfontein	287	361	361	297	1,306
Vaal Reefs	1,069	1,129	1,078	1,052	4,328
Western Areas	175	171	164	163	673
Western Deep Levels	79	82	83	78	322
TOTAL	3,848	3,793	3,513	3,377	14,531

[1]Excludes Palabora Mining Company, which is not a member of the Chamber of Mines.
[2]Mining operations ceased and underground reclamation completed.
[3]ERGO = East Rand Gold and Uranium Co. Ltd.
[4]JMS = Free State Joint Metallurgical Scheme.

Table 4

URANIUM AND GOLD PRICES

Date	Nuexco Exchange Value (per lb. U_3O_8)	Percent Change	Gold Price (per ounce)	Percent Change	Exchange Rate (rand/dollar)	Percent Change
December 30, 1983					1.2182	
US Dollars	22.00		381.50			
SA Rand	26.80		464.74			
December 31, 1984					1.9666	+61
US Dollars	15.25	-31	309.00	-19		
SA Rand	29.99	+12	607.68	+31		

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RECENT DEVELOPMENTS

UNITED STATES

DOE announced that it has negotiated a concession from Tennessee Valley Authority (TVA) over the price of electricity purchased for use at two of DOE's uranium enrichment plants, in Paducah, Kentucky and Oak Ridge, Tennessee. Under the agreement, TVA would offer to supply low-cost electricity, called Experimental Test Energy (ETE), during TVA's non-peak hours, and would determine in advance the amount of ETE to be available. This follows Duke Power Company's 1984 offer to sell electricity to DOE at 18 mills/megawatt-hour (MWh), which failed when TVA refused to wheel the power to the enrichment plants.

DOE, in presentations to news media, publicized a 20-percent discount. However, it is clear that the actual savings will finally amount to less than one dollar per SWU. Various reports estimate the discount to be from 37 cents off the base cost per SWU to a 68-cent-per-SWU discount. The following pro forma analysis demonstrates the reasoning by which the estimated savings may be calculated.

Table 5 indicates DOE's approximate power costs before the announcement of the potential TVA agreement.

Given that DOE pays 25 mills per kilowatt-hour for firm energy (without the new discount), Table 5 can be used to estimate that DOE could buy a maximum of about 4,500 megawatts of electricity (MWe) from TVA in a given year. If DOE took less, it still would pay about 11 mills per MWe not taken.

The TVA discount for ETE could apply on weekends, holidays, and from 10 p.m. to 6 a.m. on weekdays. In the following calculations, it is assumed that the discount would be applied 40 percent of the time. The average TVA price for firm energy then becomes 23 mills per kilowatt-hour. If DOE continues to take 500 MWe per year from TVA, the average TVA price with the new discount will be:

$$\frac{11\ (4{,}500 - 500) + 23\ (500)}{500}$$

$$= 111 \text{ mills per KWh}$$

The overall price averaged over all suppliers will be:

$$\frac{(500 \times 111) + (1{,}380 \times 18.5) + (735 \times 23.6)}{2{,}615}$$

$$= 37.6 \text{ mills per KWh}$$

This represents an actual power cost reduction of one percent over the current cost of 38.0 mills per KWh, provided DOE does not redistribute their energy demand.

Assuming that 50 percent of the DOE SWU price to utilities is ascribed to energy costs, the TVA discount could yield a SWU price reduction of 0.5 percent, or 68 cents, if such a discount were fully passed on to the customers. Other assumptions would yield different numbers, but the reasoning would remain the same.

Table 5

DOE POWER COSTS

	Before July 1984		July 1984 to Oct. 1984		After Oct. 1984	
Source	Amount Purchased (MW/yr)	Unit Cost (mil/KWh)	Amount Purchased (MW/yr)	Unit Cost (mil/KWh)	Amount Purchased (MW/yr)	Unit Cost (mil/KWh)
TVA	1,140	57.3[1]	650	91.1[1]	500	113.2[1]
OVEC[2]	1,260	17.9	1,260	17.9	1,380	18.5
EEI[3]	735	22.1	735	22.1	735	23.6
Total (Average)	3,135	(33.2)	2,645	(37.1)	2,615	(38.0)[4]

[1]Includes charge for power not taken.
[2]OVEC = Ohio Valley Electric Corp.
[3]EEI = Electric Energy Inc.
[4]Represents a 14.5-percent increase over the pre-July price.

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1984 US URANIUM ACTIVITIES

Introduction

Uranium exploration and mining activities decreased steadily throughout 1984 as the market for uranium concentrates continued the downward trend that began during the last quarter of 1983. Reduced competition for limited sales opportunities created a brief respite in the price decline, holding the Nuexco Exchange Value at $17.50 per pound U_3O_8 during the period June through September. However, as sellers adjusted to renewed market pressure, even lower prices prevailed. By year end, the Nuexco Exchange Value had reached $15.25, its lowest level since January 1975.

US uranium production for 1984 is estimated by Nuexco at about 15.4 million pounds, down from 21.2 million pounds in 1983. Solution mining in the South Texas district and phosphoric acid production in Florida and Louisiana accounted for almost 35 percent of the 1984 output. Conventional production centers continued to curtail activities during the year. Three milling operations closed down for six or more months, and several other projects were put on temporary stand-by, announcing intent to resume operations as the market recovers.

Exploration and development drilling activity declined as expected based on an active rig count. Nuexco estimates total drilling at 2.0 to 2.5 million feet as compared to DOE's estimate of 3.5 million feet for 1983. (*Note:* DOE no longer collects drilling and ore reserve information related to the uranium resource industry.) Nuexco's estimate is based on information supplied by a survey of selected companies.

Exploration drilling by at least six companies in the South Texas district averaged seven working rigs per month throughout the year; development drilling averaged six rigs per month.[1] Throughout Arizona, Colorado, Nebraska, New Mexico, Utah and Wyoming, at least 13 companies participated in drilling, with an average monthly rig count of 14 for exploration drilling and seven for development drilling. In the Grants, New Mexico district, for many years the most active district in the USA, there was no exploration drilling for eight months of the year, but one to four companies drilled during August to fulfill annual property requirements; development drilling was limited to nine months with one to three rigs.

Active Projects

Exploration activity in the South Texas district continued along known geologically favorable trends located primarily in Duval, Brooks and Kleberg counties. The favored targets were fine to coarse sand and conglomerate units of the Goliad Formation. Further north in Live Oak and Bee counties, the main target remains the Oakville Sandstone. There were no significant discoveries announced in 1984; however, development drilling in certain areas proved successful in delineating additional reserves and enhancing certain active solution-mining operations.

The area north and south of Grand Canyon National Park experienced a slight surge in activity. Five or six major uranium companies continued to acquire new ground for exploration, including geophysical and drilling programs. The exploration target is potentially high-grade deposits in breccia pipe structures common to the district. In addition, another eight to ten small exploration companies and independent operators competed for the more favorable exploration targets. Constructive exploration was limited primarily to annual work requirements related to conditions of property acquisition.

Energy Fuels Ltd. (EFL) remains the most aggressive and successful operator in the district. EFL presently is mining three highly mineralized breccia pipe deposits and is developing a fourth scheduled for production sometime in late 1987 or early 1988. In addition, EFL has applied to federal and state agencies with the intent of developing yet another deposit. The proposed project site is the Canyon pipe located on the south side of the Grand Canyon. If the project proceeds, it will be the first uranium mining in the southern rim district since the Orphan pipe was last mined in 1969.

Ferret Exploration Company continued to explore its Big Red property in Dawes and Box Butte counties of Nebraska. The mineral trend at the large Crow Butte deposit has been traced for several miles south onto the Big Red property. Ferret remains optimistic about property potential as a result of the important uranium resources identified to date.

Development of the Crow Butte project (owned 50 percent by Wyoming Fuel Company and 50 percent by Ferret) has been delayed by the permitting process. The joint venture anticipates licensing and permitting requirements will be in place in early 1985 and construction of a solution-mine pilot plant should begin by mid-to-late 1985.

Everest Minerals Corp. is continuing project feasibility studies on its Highland property located in South Powder River Basin, Wyoming. Everest has announced its intent to develop a solution mine on the property, probably during the second half of 1986. The ore deposit is a down-dip westward extension of Exxon's open pit, which closed in March 1984.

Events that further affected the US uranium industry in 1984 are listed chronologically in Table 6.

[1] It should be noted that by Nuexco estimate, drilling time per rig varies from 1 to 23 days per month and may average less than 10 working days per rig; thus, footage drilled was held below normal capabilities.

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RAW MATERIALS

Table 6

1984 URANIUM-RELATED ACTIVITIES IN THE USA

Month	Organization	Event or Announcement
Jan	Union Carbide Corp.	Reached agreement with Energy Fuels for operatorship and 70% of production capacity at the Energy Fuels Mill at White Mesa, Utah.
Jan	Western Nuclear, Inc.	Announced plan to reopen the mine at Ruby Wells, New Mexico.
Feb	Atlas Corp.	Closed the Velvet, Pandora and Rim mines. Announced plans to close the Moab mill; 200 employees affected.
Feb	US DOE	Estimated 1983 production at 21.2 million pounds compared to 26.9 million in 1982.
Feb	United Nuclear Co.	Ended negotiations to purchase Ogle uranium properties in Wyoming.
Mar	Reserve Oil & Minerals Corp.	Agreed to sell its Canadian uranium interests.
Mar	Pathfinder Mines Corp.	Closed its underground mining operations off the pit walls of the Lucky Mc mine, Gas Hills, Wyoming.
Mar	American Nuclear Corp.	Agreed in principle with TVA to end joint venture on properties in Wyoming.
Mar	Exxon Nuclear Co.	Closed its Highland open-pit mine, Powder River Basin, Wyoming.
Mar	Ranchers Corp.	Announced plans to merge with Hecla Mining Co.
April	Caithness Corp.	Began restoration at the McBryde solution mine, Hebbronville, Texas.
April	Tenneco Minerals Co.	Suspended production at West Cole solution mine, Hebbronville, Texas.
April	Union Carbide Corp.	All mineral resources to operate under new subsidiary—UMETCO Minerals Corp.
April	Plateau Resources Ltd.	Closed its mine at Shootaring Canyon, Utah.
June	Quivira Mining Co.	Laid off 276 employees in 40% cutback of mine and mill operations.
June	Exxon Nuclear Co.	Closed its Highland mill, Powder River Basin, Wyoming.
July	Western Nuclear, Inc.	Will reopen the Ruby Wells mine, recalling 70 employees.
July	Union Carbide Corp.	Announced intent to put all mining projects on standby during fourth quarter.
Aug	Western Nuclear, Inc.	Closed its Sherwood, Washington mine and mill.
Aug	Tennessee Valley Authority	Announced offer to sell open pit properties, Gas Hills, Wyoming.
Sept	Homestake Mining Co.	Placed its Grants, New Mexico mill on standby; 60 employees affected.
Oct	Union Carbide Corp.	Closed mills at Uravan, Colorado and Gas Hills, Wyoming. 30 employees laid off.
Nov	Federal Trade Commission	FTC approved merger plan for Chevron Corp. and Gulf Corp. Chevron will control the Mt. Taylor deposit, Grants, New Mexico.

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Table 6

1984 URANIUM-RELATED ACTIVITIES IN THE USA *(continued)*

Month	Organization	Event or Announcement
Nov	Homestake Mining Co.	Broke off negotiations with Midas, Inc., for participation in mine development at Grants, New Mexico.
Dec	American Nuclear Corp.	Reached final agreement with TVA to settle joint venture relationship in relation to properties in the Gas Hills and Powder River Basin, Wyoming.
Dec	Energy Fuels Nuclear, Inc.	Applied for permits to develop breccia pipe deposit on south side of the Grand Canyon, Arizona.
Dec	Union Carbide Corp.	Suspended uranium exploration affecting 50 employees; announced intent to stop all mining projects by March, 1985.
Dec	Pathfinder Mines Corp.	Will spend $4 million to modernize the Lucky Mc mill, Gas Hills, Wyoming.
Dec	Homestake Mining Co.	Recalled 20 employees in preparation of mill startup in early January.

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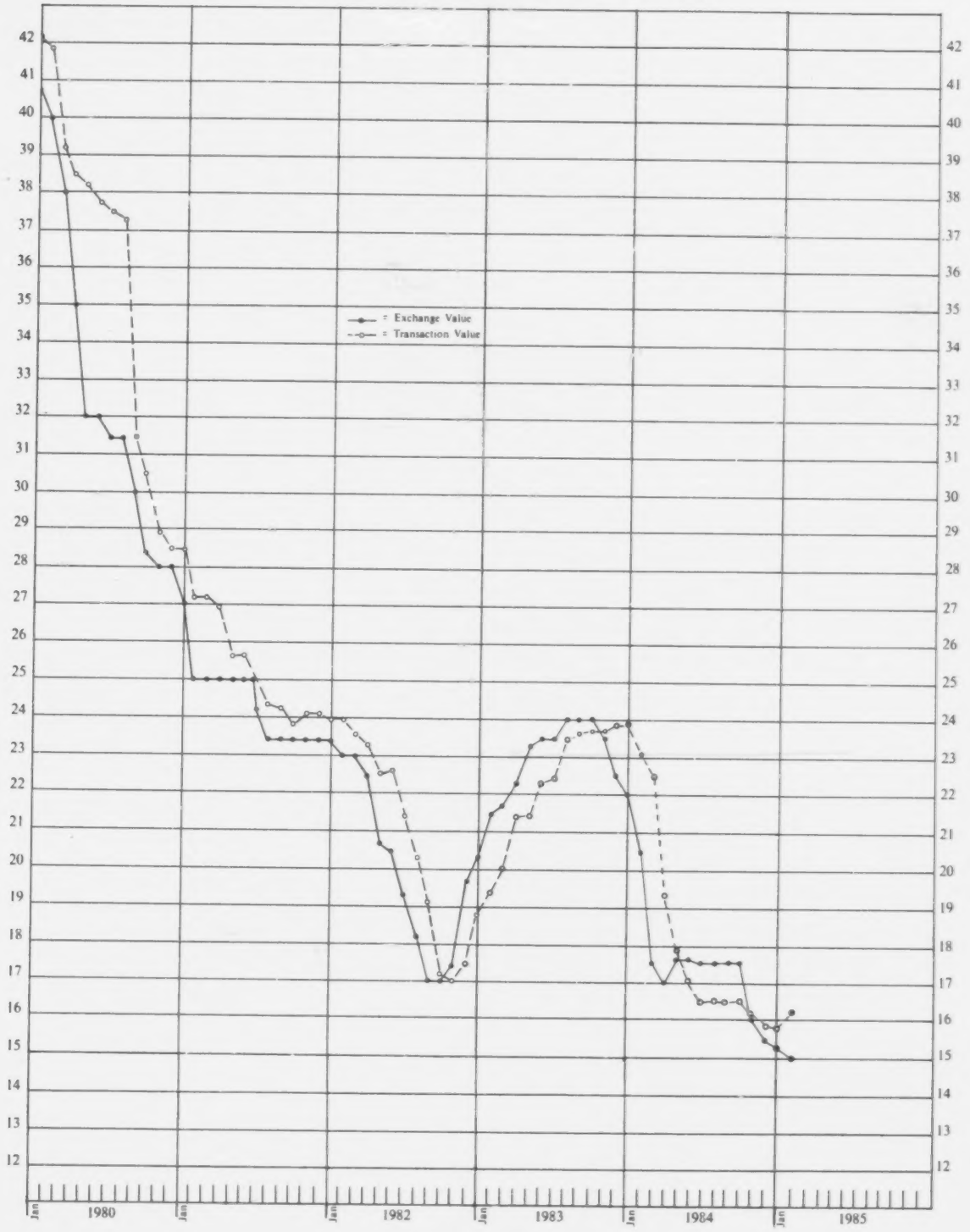
HISTORICAL MARKET DATA

EXCHANGE AND TRANSACTION VALUES
SINCE JANUARY 1980
Determined as of the last day of the month indicated



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HISTORICAL EXCHANGE VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	6.35	6.35	6.40	6.45	6.50
1969	—	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	32.50	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50	23.50	23.50	23.50
1982	23.00	23.00	22.50	20.75	20.50	19.25	18.25	17.00	17.00	17.50	19.75	20.25
1983	21.50	21.75	22.25	23.25	23.50	23.50	24.00	24.00	24.00	23.50	22.50	22.00
1984	20.50	17.50	17.00	17.75	17.75	17.50	17.50	17.50	17.50	16.00	15.50	15.25
1985	**15.00**											

HISTORICAL TRANSACTION VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	—	—	—	—	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90	24.10	24.10	24.00
1982	24.00	23.70	23.40	22.60	22.70	21.50	20.30	19.10	17.30	17.00	17.55	18.80
1983	19.35	20.00	21.35	21.40	22.35	22.45	23.50	23.60	23.65	23.65	23.85	23.85
1984	23.05	22.50	19.25	17.90	17.00	16.50	16.60	16.40	16.55	16.05	15.90	15.90
1985	**16.20**											

HISTORICAL CONVERSION VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U as UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981	1.20	1.20	1.20	1.40	1.15	1.15	1.15	1.10	1.10	1.10	1.20	1.20
1982	1.20	1.20	1.20	1.20	1.00	1.00	1.00	0.90	1.10	1.60	1.45	1.45
1983	1.20	1.40	1.40	1.20	1.20	1.20	1.10	1.10	1.00	0.60	0.60	0.60
1984	0.60	0.30	0.80	0.80	0.80	0.00	0.00	0.80	1.00	1.00	0.80	0.80
1985	**1.00**											

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GOVERNMENT STATISTICS

AUSTRALIA

	Price Index of Materials Used in Manufacturing Industry—All Groups[1] (1969=100)	Award Rates of Pay Indexes Australia—Adult Males In Mining Wage and Salary Earners, Weekly Rate[2] (1976=100)
1983 Avg.	401.2	181.8
Oct 1983	397.5	188.3
Nov 1983	395.5	188.3
Dec 1983	399.2	188.1
Jan 1984	399.2	188.6
Feb 1984	402.5	188.5
Mar 1984	403.9	188.3
Apr 1984	404.2	196.2
May 1984	403.8	197.0R
Jun 1984	404.9	197.0R
Jul 1984	408.5	197.0R
Aug 1984	413.3	197.0R
Sep 1984	412.1	197.0R
Oct 1984	408.6R	197.0
Nov 1984	407.2	197.0

P = Preliminary R = Revised since last month

CANADA

		Wage-earner Data: Average Hourly Earnings (C$)[2]					
	Industry Selling Price Index: Manufacturing[1] (1971=100)	Uranium Mines (SIC 057)	Metal Mines* (SIC 051-059)	Mines, Quarries and Oil Wells[3] (SIC 051-099)	Primary Metal Industries Non-ferrous[4] (SIC 296)	(SIC 298)	Chemicals and Chemical Products[5] (SIC 372-379)
1983 Avg.	298.8	—	—**	14.30	—	—	11.17
Dec 1983	302.9	17.84	15.11	14.66	11.86	10.60	11.51
Jan 1984	305.4	17.74	15.27	14.74	11.91	10.84	11.69
Feb 1984	306.6	17.78	15.59	14.90	12.04	10.82	11.51
Mar 1984	308.7	18.05	15.52	14.82	12.14	10.84	11.58
Apr 1984	310.5	18.06	15.83	15.10	11.96	10.34	11.63
May 1984	310.6	18.48	15.64	15.06	12.11	10.16	11.65
Jun 1984	311.0	18.08	15.48	14.80	12.38	10.40	11.66
Jul 1984	312.7R	17.81	15.72	14.92	12.53	10.18	11.82
Aug 1984	312.4R	17.24	15.36	14.92	12.44	10.34	11.78
Sep 1984	312.0	17.68	15.96	15.34	12.51	10.52	11.90
Oct 1984	312.3	17.64	16.15R	15.26R	12.69R	10.56R	11.96R
Nov 1984	313.5	18.08P	16.10P	15.35P	12.47P	10.53P	11.99P
Dec 1984	313.9	—	—	—	—	—	—

P = Preliminary R = Revised since last month

For annual averages prior to 1983, and for notes pertaining to these statistics, see pages 23-26 of Report 190 of June 1984.

* The 1980 average for Metal Mines was incorrectly reported as 10.59. The correct average is 10.58 (see Report 190).

** Two different methods were used in the 1983 "Metal Mines" category in reporting survey data, and Statistics Canada did not publish a 1983 average. The March 1983 figure for the old method was 14.73 and for the new method was 14.84. The published average for 1983 in Report 190 was a Nuexco calculation based on the available monthly statistics for 1983 with the exception of the March figure, where only the 14.84 value was taken into account.

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GOVERNMENT STATISTICS

REPUBLIC OF SOUTH AFRICA

	Average Declared Working Costs per per Metric Ton of Gold Ore Milled (Rand)[1]	Tonnage-Weighted Index of Average Working Costs per Metric Ton of Gold Ore Milled (March 1982=100)[2]	Consumer Price Index[3] (1975=100)[4]	Producer Price Index All Groups[5] (1975=100)	Total Employment in Mining and Quarrying (Code 35)[6]	Total Salaries and Wages in Mining and Quarrying (1,000 Rand) (Code 40)[6]
1983 Avg.	51.87	115.0	262.2	274.8	696,579	3,644,772
Nov 1983	—	—	271.4	281.6	688,459	317,485
Dec 1983	53.70	119.6	273.2	283.7	690,750	333,595
Jan 1984	—	—	274.7	283.3	689,807	326,619
Feb 1984	—	—	278.4	286.5	702,553	335,906
Mar 1984	55.30	123.1	281.9	288.0	715,628	342,332
Apr 1984	—	—	286.1	290.2	712,963	327,550
May 1984	—	—	288.3	292.6	710,040	327,937
Jun 1984	56.95	126.2	291.2	295.3	717,009	347,121
Jul 1984	—	—	295.1	296.0	717,121	369,964
Aug 1984	—	—	297.0	300.8	721,905	361,357
Sep 1984	60.64	133.2	299.9	304.1	721,470R	359,218
Oct 1984	—	—	303.7	308.7	717,865	363,755
Nov 1984	—	—	307.4	312.8	—	—
Dec 1984	—	—	309.4	—	—	—

UNITED STATES

	Producer Price Index[1]		Consumer Price Index[2]	GNP Implicit Price Deflator[3]	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
	Industrial Commodities (1967=100)	All Commodities (1967=100)	(1967=100)	(1972=100)	Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
1983 Avg.	315.8	303.1	298.4	215.63	12.57	13.43	10.59	8.65
Nov 1983	318.3	305.5	303.1	—	12.64	13.56	10.86	8.77
Dec 1983	318.4	306.1	303.5	218.53	12.75	13.33	10.90	8.84
Jan 1984	319.1	308.0	305.2	—	12.67	13.38	10.91	8.88
Feb 1984	320.6	308.9	306.6	—	12.81	13.34	10.90	8.86
Mar 1984	321.9	311.0	307.3	220.58	12.85	13.33	10.95	8.88
Apr 1984	322.5	311.4	308.8	—	12.91	13.30	10.97	8.89
May 1984	323.3	311.7	309.7	—	12.99	13.37	11.02	8.89
Jun 1984	323.9	311.4	310.7	222.40	12.96	13.40	11.03	8.91
Jul 1984	324.0	312.0	311.7	—	13.02	13.36	11.12	8.95
Aug 1984	323.5	310.9	313.0	—	13.10	13.51	11.13	9.00
Sep 1984	322.3	309.5	314.5	224.36	13.20	13.39	11.23	9.08
Oct 1984	323.2	309.4	315.3	—	13.23R	13.53	11.32R	9.09R
Nov 1984	323.8	310.4	315.3	—	13.23	13.76	11.35R	9.15R
Dec 1984	323.0	309.9	315.5	225.90	13.21P	13.65P	11.35	9.26
Jan 1985	—	—	—	—	—	—	11.37P	9.33P

P = Preliminary R = Revised since last month

For annual averages prior to 1983, and for notes pertaining to these statistics, see pages 23-26 of Report 190 of June 1984.

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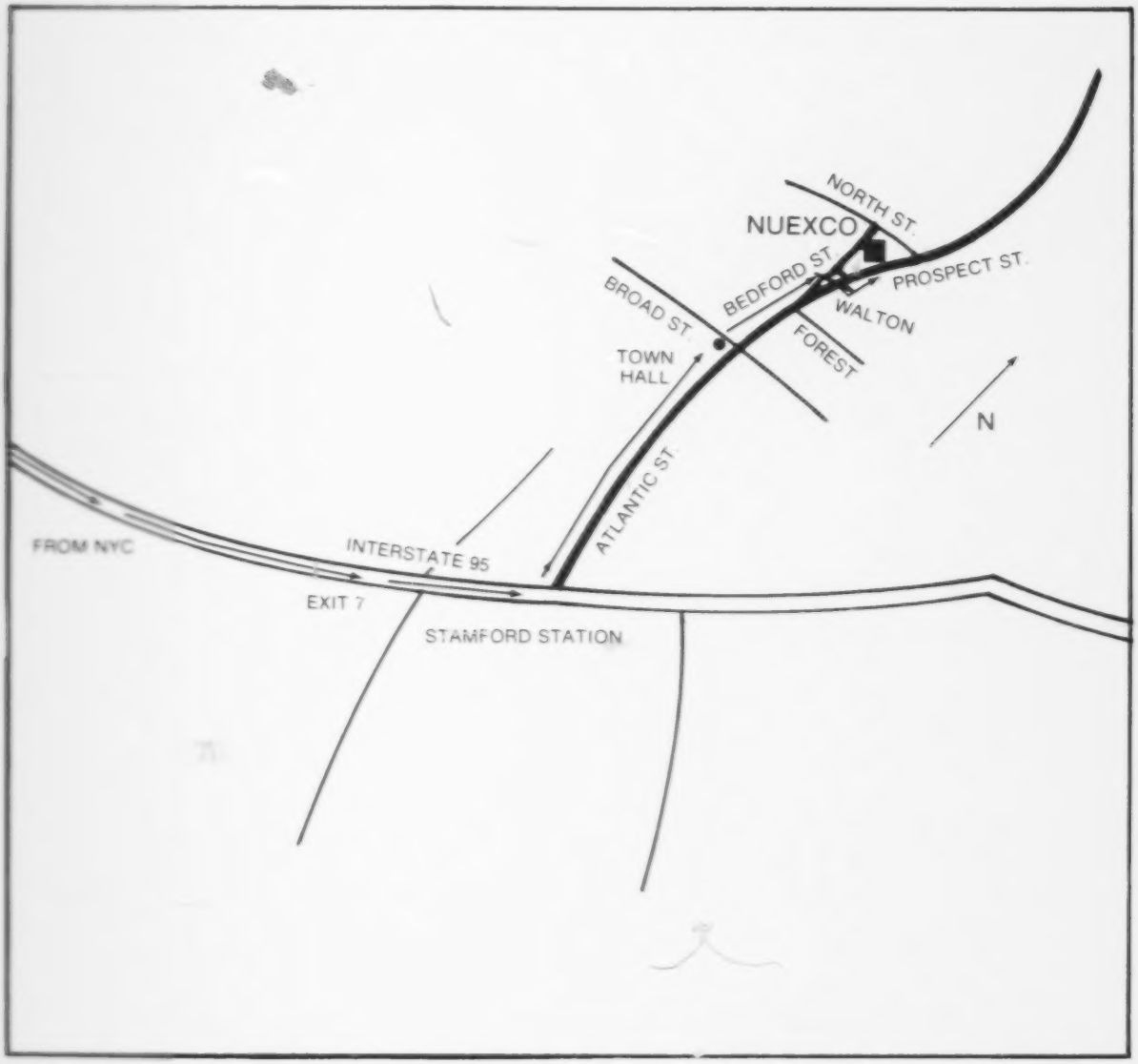

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From New York City, take Interstate 95 North (Connecticut Turnpike).

Take Atlantic Street exit (Exit 8).

Left onto Atlantic Street. Follow for approximately 1/2 mile.
Atlantic will turn into Bedford Street at the Stamford Town Center.
Keep following Bedford Street through two stoplights.
After the second light, take a right onto Walton Place.
At stop sign, take a left onto Prospect Street. Our parking lot (underground) is located at 100 Prospect Street.

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